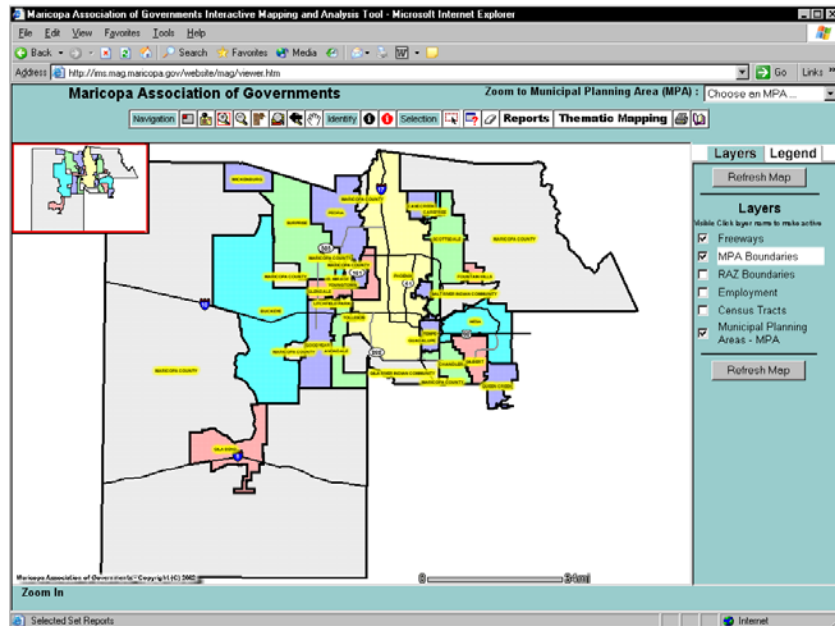


MAG Interactive Mapping and Analysis Tool

User Guide



DRAFT

July 30, 2004



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<http://ims.mag.maricopa.gov/website/mag>

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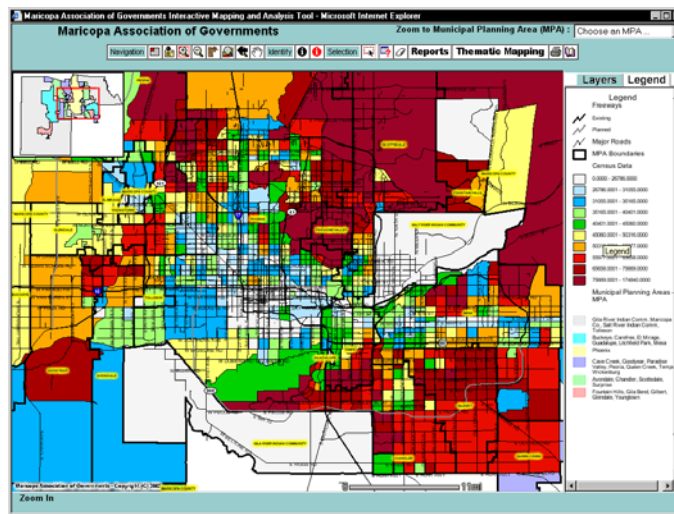
INTRODUCTION

The MAG Interactive Mapping and Analysis Tool is an Internet Map Server (IMS) application that allows users to create maps and perform analysis of displayed data in a graphical format.

In addition to mapping MAG GIS data layers, users can perform analysis on those layers to create a thematic map. A thematic map displays geographic boundary data based on values contained within a table by ranges. For instance, a user can create a median household income map like the one displayed in the image below based on the boundaries of the 2000 Census Tracts. This tool also allows more complex analyses such as change in densities to be calculated and displayed. This type of analysis can be currently performed on Census Tract data and projection data at the Regional Analysis Zone (RAZ) level.

Statistical Reports that summarize a selected set of records can be created for both RAZ and Census data.

After an analysis or report is created it can be printed to create a hard copy version.



WEB PAGE OVERVIEW

The web page displayed below is the starting point to create and analyze data. The web page is composed of three major components that allow the user to interact with the web page.

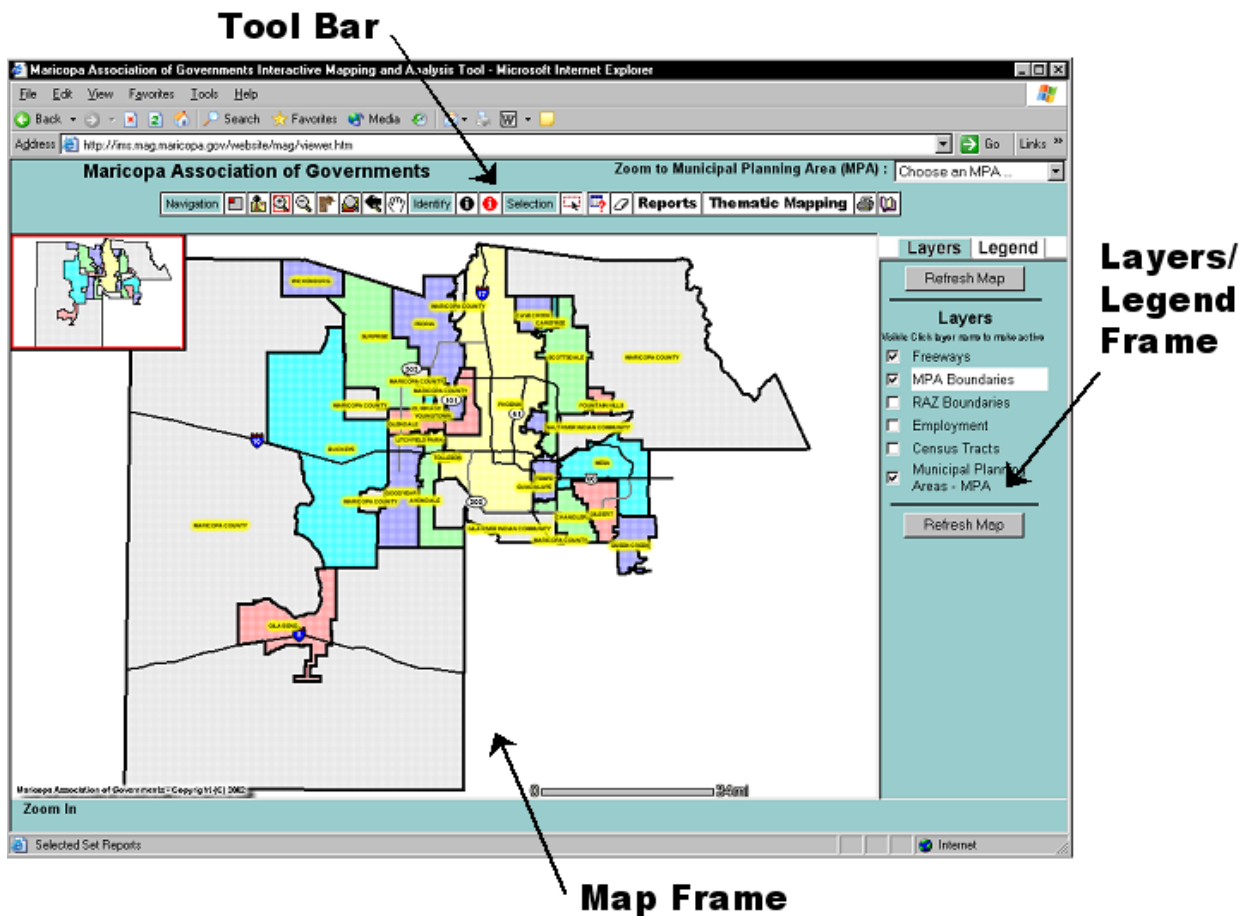


Figure 1 - Web Page Layout

1. Map Frame

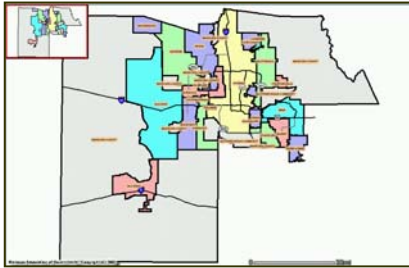


Figure 2 - Map Frame with Overview Map

2. Layers/Legend Frame

On the right hand side of the web page is where users can change the map layers that can be seen in the map frame and to see the symbols used to represent those layers. This frame has two parts, layer and legend. When first opened, the web page will display the layers frame (Figure 3). To change from the layer to legend click the ‘legend’ tab with the cursor and the symbols for each layer will be displayed (Figure 4).

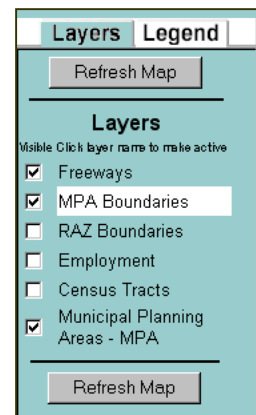
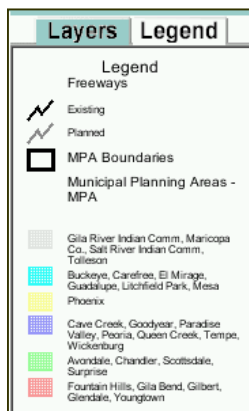


Figure 3- Layer/Legend frame with Layers Displayed



To change the layers that are displayed in the map frame click the ‘visible’ box in front of the layer name in the layers frame. A check in the visible box in front of the layer means that it is displayed in the map frame. When the web site is opened, Freeways, MPA Boundaries, and Municipal Planning Areas -MPA are visible. For changes to take effect, the ‘Refresh Map’ button in the layers frame must be clicked after making changes.

Figure 4 – Layers/Legend frame with Legend Displayed

For example, if the user wanted to make the Employment layer visible and turn off the Freeways layer, you would click the box in front of freeways to remove the check and then check in front of the Employment layer to place a check in front of that layer. To make your changes appear, you need to click the ‘Refresh Map’ button on the bottom of the layers frame.

When a web page is first opened, the MPA Boundaries is the active layer. This is symbolized by the white rectangle around the layer name in the layers frame and means that further analysis can occur on that layer. The selection, identify, and thematic mapping tools described later in this document rely on the active layer for their function. Only one layer can be active at a time. To change which layer is active, click on the layer name and the white rectangle will change to that layer.

3. Tool Bar

Displayed at the top of the web page, this contains the tools that allow users to interact with the map (Figure 5). The Tools are organized into the following categories; Map Navigation, Feature Identification, Selection Tools, Reports, Thematic Mapping, Print, and Help with each represented by a unique image.

Note: The Toolbar status for most tools will display in the lower left corner of the web page. The tool in use will have a red box around it in the toolbar. The toolbar's function can be seen by moving the mouse (pointer) over the tool's image in the tool bar.

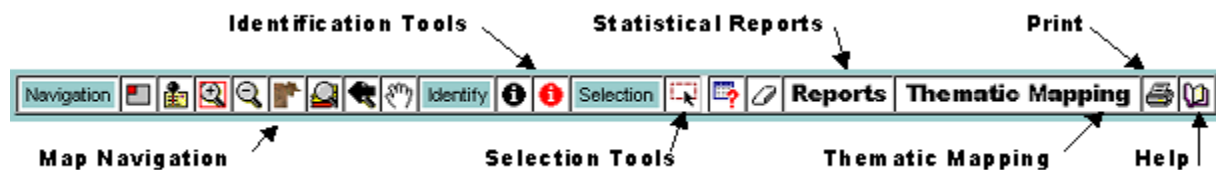




Figure 6 – Tool Bar Layout


Tool Bar Continued...

MAP NAVIGATION


 - **Toggle Overview Map:** Click on this to turn overview map (described in Map Frame Section) on or off.

 - **Locate Address:** Click this to locate an address.


 - **Zoom in:** To zoom into an area on the Map Frame, click the crosshairs on the area you would like to zoom to. To zoom to a specific area, hold down the left button on the mouse and draw a box. Release the left button to zoom to that area.

 - **Zoom out:** Click the crosshairs on map frame to zoom out incrementally.


 - **Zoom to MAG Full Extent:** Zooms map frame to Maricopa County limits.


 - **Zoom to active layer:** Zoom Map Frame to the active layer's extent. In most cases this will zoom to the boundary of Maricopa County.

 - **Back to last extent:** Map Frame zooms to previous extent visited.


 - **Pan:** Click and hold the left button on the mouse to move the Map Frame and change the view displayed.

IDENTIFICATION TOOLS

 - **Identify:** Click on a specific location on the Map Frame to display information (attributes) of the active layer (see legend layer discussion above for active layer discussion).


 - **ID Visible Features:** Click on a specific location on the Map Frame to display information (attributes) of all visible layers (see legend layer discussion above for active layer discussion).

SELECTION TOOLS

 - **Select by Rectangle:** This allows features to be selected from the active layer (see legend layer discussion above for active layer discussion). To select features, click and drag the mouse to draw a box, release mouse button to stop drawing box. This will select features in the active layer in the map frame that are touched by the rectangle. To select single features, click once on the feature in the active layer.

Note: This selection can be used with the reports tool describe later.

Tool Bar Continued...

 **Query:** Allows a user to select features from the active layer based on a value contained within a field. Click the tool button and a dialog box will appear (Figure 6) allowing the user to enter a field name, operator (such as =, <, or >) and a value to search for. Once the previous items are selected, click 'Add to Query String' and then click 'Execute Query' to search layer.

Note: This selection can be used with the reports tool describe later.

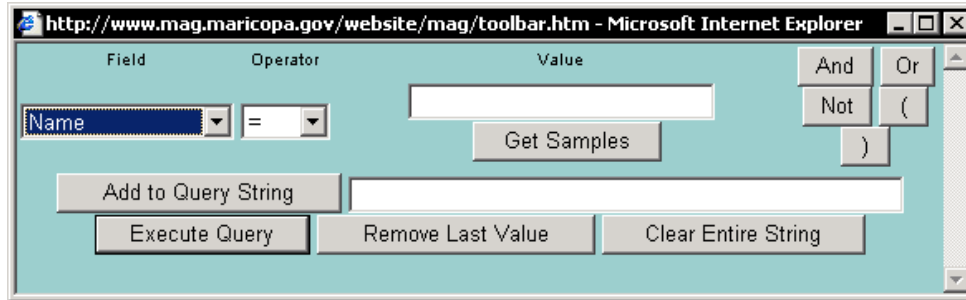

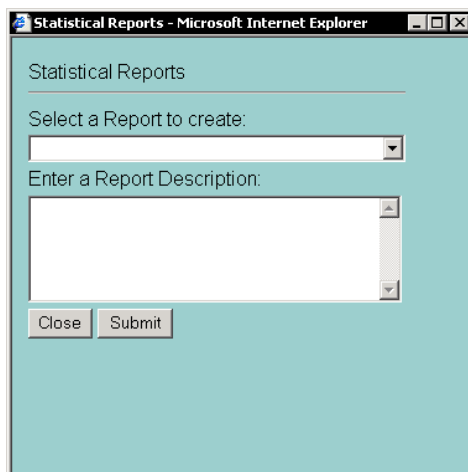
A screenshot of a web browser window titled "http://www.mag.maricopa.gov/website/mag/toolbar.htm - Microsoft Internet Explorer". The page contains a query tool interface. It has three main input areas: "Field" with a dropdown menu showing "Name", "Operator" with a dropdown menu showing "=", and "Value" with a text input field. To the right of these are buttons for "And", "Or", "Not", "(", and ")". Below the "Field" and "Operator" inputs is a "Get Samples" button. Below the "Value" input is an "Add to Query String" button. At the bottom are three buttons: "Execute Query", "Remove Last Value", and "Clear Entire String".

Figure 6 - Query Tool Dialog Box

 **Clear Selection:** Clears any selections created with previously described selections tools.

REPORTS

A screenshot of a web browser window titled "Statistical Reports - Microsoft Internet Explorer". The page contains a "Statistical Reports" dialog box. It has a label "Select a Report to create:" followed by a dropdown menu. Below that is a label "Enter a Report Description:" followed by a text input field. At the bottom are two buttons: "Close" and "Submit".

Reports - Creates statistical reports from selected set of Census or RAZ records. To use this tool, the user needs to first select a set of records from either the RAZ or Census data with one of the selection tools described above. Clicking on the 'Report' button launches a dialog box (Figure 7). Examples of the reports available in the 'Select a Report' dropdown menu can be found in Appendix A. A description of the report (title) can be entered into the box shown in Figure 7 to be included in the output.

Once the report type and title have been selected, click the 'Submit' button to create a report.

Figure 7 – Statistical Reports Dialog Box

THEMATIC MAPPING

Thematic Mapping- Creates a map for RAZ or Census data based on a value in a layer. For instance, dividing the population field by the square miles field creates a population density map. Clicking on this tool starts dialog box that asks the user to choose which layer they would like to do an analysis on. The layer needs to be active and visible in order to perform an analysis.

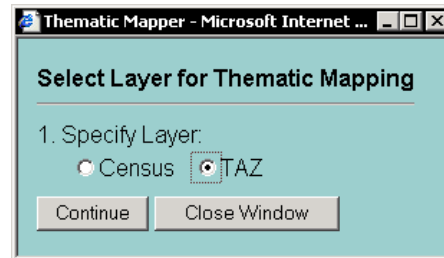


Figure 8 - Thematic Mapper 'Select Layer' Box

Next, a second window (Figure 9) appears that requires user inputs to create a thematic map.

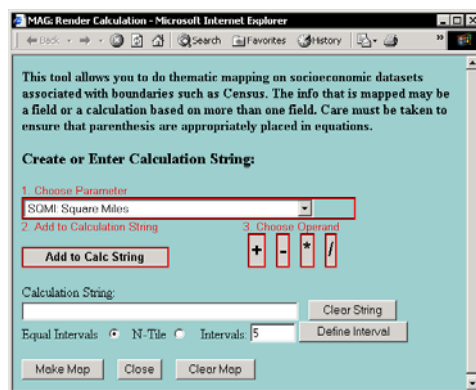


Figure 9 – Render Calculation

Thematic mapping allows the user to create maps based on three types of intervals, Equal, N-Tile, and User Defined. Equal interval by five intervals is the type that is chosen when the Render Calculation Dialog Box is first selected. An equal interval is created by dividing the difference between the maximum and the minimum values in a record set by the number of intervals. For instance, if one is mapping population and the maximum population is 1500 and the minimum population is zero and the intervals are five, this will result in five intervals of 300 each. The records are distributed into the corresponding ranges. This method may lead to a skewing of data if there are many large or small numbers. To minimize the effects of this skewing, the N-Tile option can be used. This method takes the number of records (in the RAZ layer this would be 145) and divides it by the number of intervals (five) resulting in intervals that provide an equal distribution of records.

The final interval type is User Defined and can be accessed by selecting the 'Define Interval' button. This allows the user to create the intervals that will be used.

A series of input boxes (Figure 10) enables users to input the interval range that will be used to map the data. The starting and ending – User Defined Intervals are calculated by the Thematic Mapper. The user then enters the values for the remaining intervals.

Figure 10 – User Defined Intervals Box

PRINT


 - **Print** – Creates a print page for display in map frame. A menu appears (Figure 11) that allows the user to choose the map size and also a title to add to the map. Clicking the ‘Create Print Page’ button will open a new browser window (Figure 12), which then can be printed by choosing ‘Print’ from the file menu.

Figure 11 – Print Form

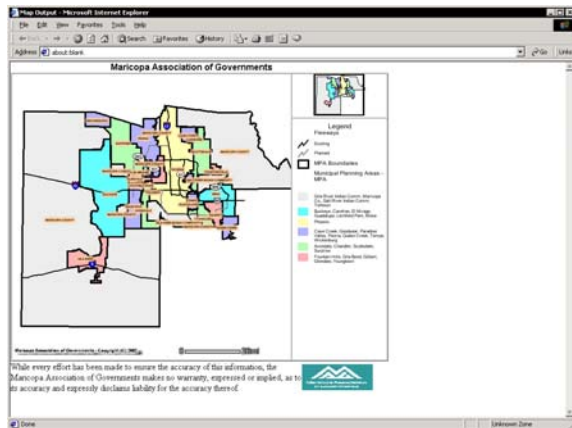


Figure 12 – Print Page

HELP

 - **Help** – Provides a link to this document in PDF format, as well as instructions for using the tools included in toolbar.



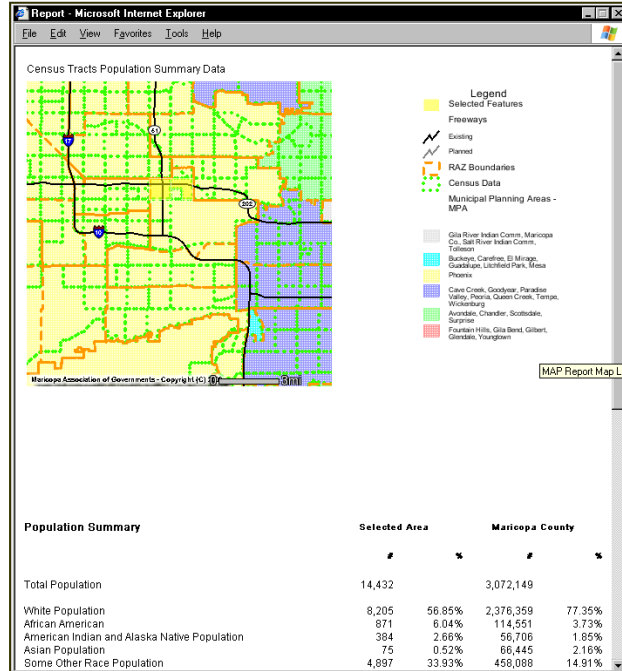
FOR MORE INFORMATION

The MAG Interactive Web Site is at URL <http://ims.mag.maricopa.gov/website/mag> and is always changing. New reports may be added depending upon the needs of the users. For comments or questions, please contact Mele Koneya, GIS Decision Support Analyst II, at (602) 254-6300 or via email at mkoneya@mag.maricopa.gov.

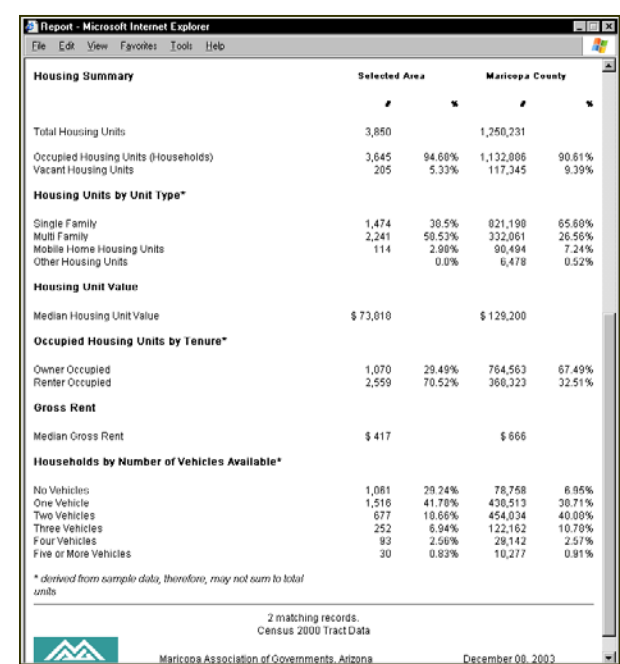
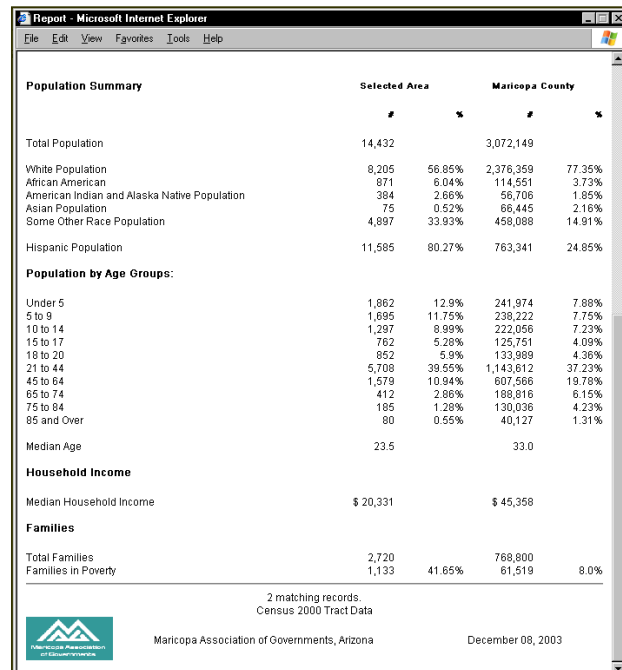
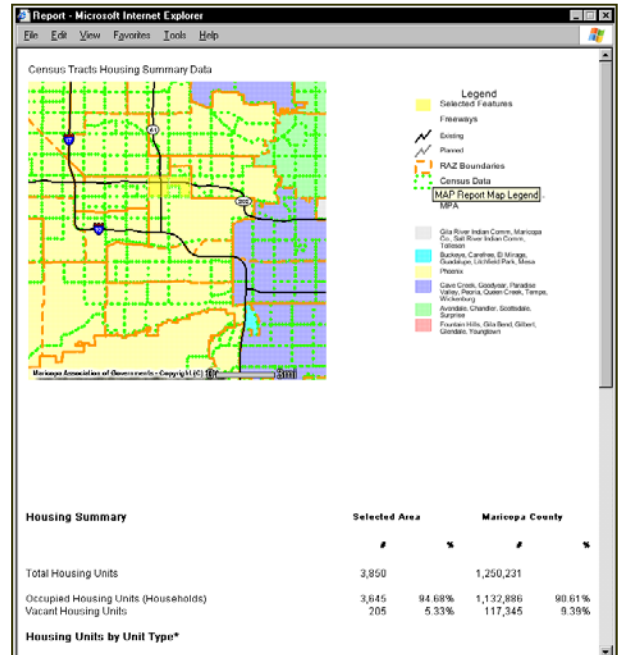
APPENDIX A

Census Tract Reports

Population Summary Report

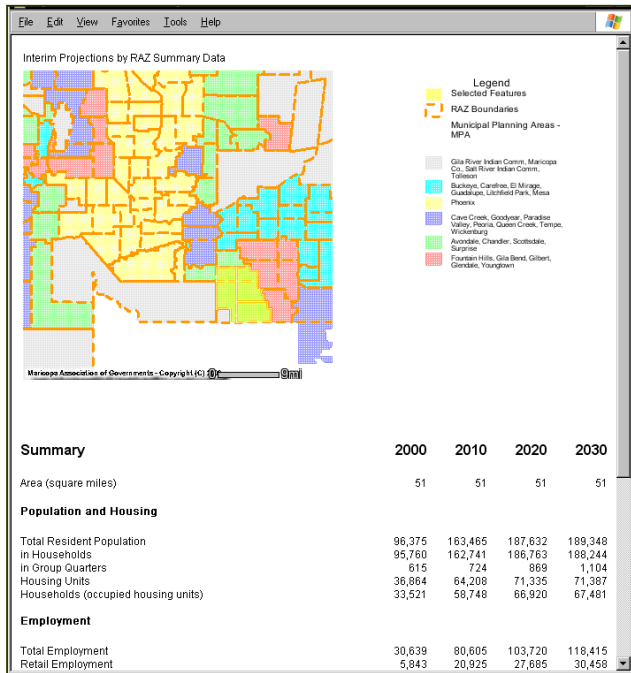


Housing Summary Report

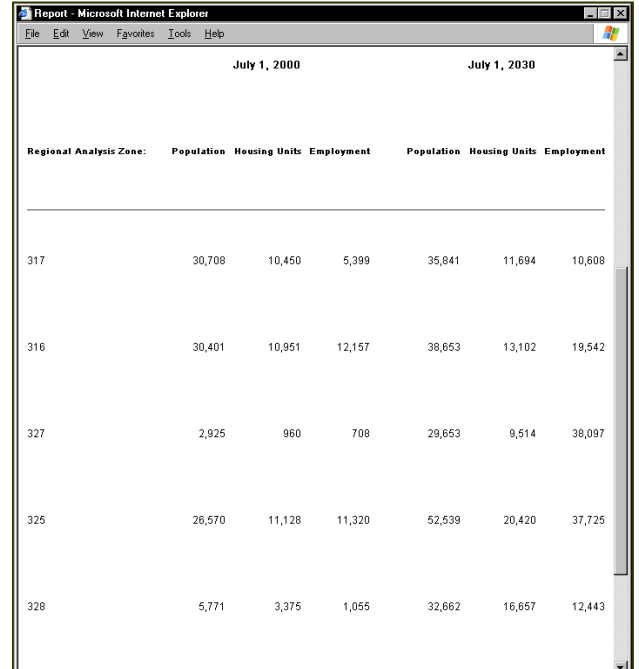
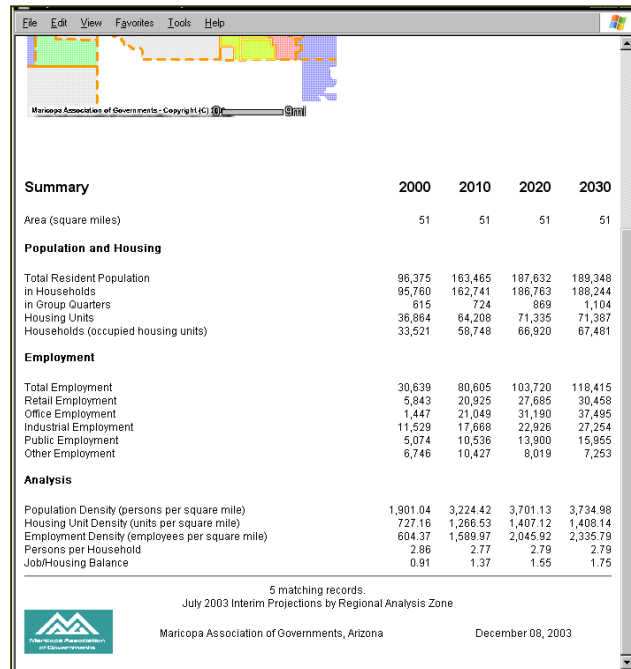
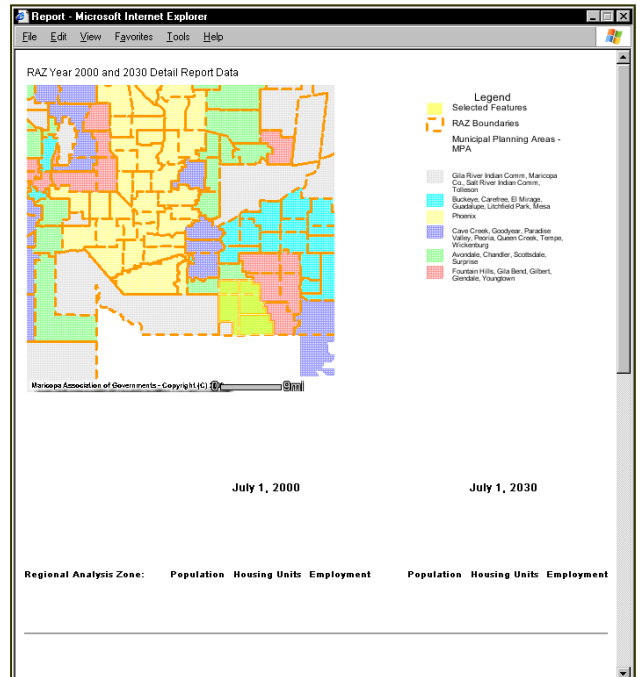


RAZ Reports

Interim Projections by RAZ Summary



RAZ Year 2000 and 2030 Detail



APPENDIX B

Maricopa Association of Governments Interactive Mapping Website

Census variables which may be used with the thematic mapper.

Source: U.S. Bureau of the Census (April 1, 2000).

Variable:	Description:
SQMI	Square Miles
TOTALPOP	Total Population
WHITE	White Population
BLACK	Black Population
AMIND	American Indian Population
ASIAN	Asian Population
OTHER	Other Population
HISPANIC	Hispanic Population
AGELT5	Population Less Than 5 Years Old
AGE5TO9	Population 5 to 9 Years Old
AGE10TO14	Population 10 to 14 Years Old
AGE15TO17	Population 15 to 17 Years Old
AGE18TO20	Population 18 to 20 Years Old
AGE21TO44	Population 21 to 44 Years Old
AGE45TO64	Population 45 to 64 Years Old
AGE65TO74	Population 65 to 74 Years Old
AGE75TO84	Population 75 to 84 Years Old
AGE85OVER	Population 85 Years and Over
MEDIANAGE	Median Age

Census variables which may be used with the thematic mapper (cont'd.)

Variable:	Description:
HU	Total Housing Units
OCCHU	Occupied Housing Units
VACHU	Vacant Housing Units
OCCRATE	Occupancy Rate
SFHU	Single Family Housing Units
MFHU	Multi-Family Housing Units
MHHU	Mobile Home Housing Units
OTHERHU	Other Housing Units
OWNOCC	Owner Occupied Housing Units
RETOCC	Renter Occupied Housing Units
MEDHUVAL	Median Housing Unit Value
MEDGRRENT	Median Gross Rent
HH0VEH	Households With No Vehicle
HH1VEH	Households with One Vehicle
HH2VEH	Households with Two Vehicles
HH3VEH	Households with Three Vehicles
HH4VEH	Households with Four Vehicles
HH5MVEH	Households with Five or More Vehicles
ILT25K	Household Income Less than \$25,000
I25TO50K	Household Income \$25,000 to \$50,000
I50TO100K	Household Income \$50,000 to \$100,000
I100KMORE	Household Income Greater Than \$100,000
MEDHHINC	Median Household Income
FAMILIES	Families
POVFAMS	Families in Poverty

Census variables which may be used with the thematic mapper (cont'd.)

Variable:	Description:
EMPPOP	Employed Population
MGMTPROF	Management and Professional Occupations
SERVICE	Service Occupations
SALESOFF	Sales and Office Occupations
OTHEROCC	Other Occupations
POP250VER	Total Population 25 Years and Over
LT9GRADE	Less than 9th Grade Education
NODIPL1012	10th to 12th Grade
HSGRAD	High School Graduate
SOMECOLL	Some College
ASSOCBACH	Associate of Bachelor Degree
GRADDEG	Graduate Degree

Maricopa Association of Governments Interactive Mapping Website

Regional Analysis Zone (RAZ) variables which may be used with the thematic mapper.

Source: MAG July 2003 Interim Projections.

Variable:	Description:	Year:
SQMILE	Square Miles	
DU00	Dwelling Units	2000
DU10	Dwelling Units	2010
DU20	Dwelling Units	2020
DU30	Dwelling Units	2030

Regional Analysis Zone (RAZ) variables which may be used with the thematic mapper (cont'd.)

Variable:	Description:	Year:
HH00	Housing Units	2000
HH10	Housing Units	2010
HH20	Housing Units	2020
HH30	Housing Units	2030
POPHH00	Population in Households	2000
POPHH10	Population in Households	2010
POPHH20	Population in Households	2020
POPHH30	Population in Households	2030
GQPOP00	Population in Group Quarters	2000
GQPOP10	Population in Group Quarters	2010
GQPOP20	Population in Group Quarters	2020
GQPOP30	Population in Group Quarters	2030
TOTPOP00	Total Population	2000
TOTPOP10	Total Population	2010
TOTPOP20	Total Population	2020
TOTPOP30	Total Population	2030
RETEMP00	Retail Employment	2000
OFFEMP00	Office Employment	2000
INDEMP00	Industrial Employment	2000
PUBEMP00	Public Employment	2000
OTHEMP00	Other Employment	2000
TOTEMP00	Total Employment	2000
RETEMP10	Retail Employment	2010
OFFEMP10	Office Employment	2010
INDEMP10	Industrial Employment	2010

Regional Analysis Zone (RAZ) variables which may be used with the thematic mapper (cont'd.)

Variable:	Description:	Year:
PUBEMP10	Public Employment	2010
OTHEMP10	Other Employment	2010
TOTEMP10	Total Employment	2010
RETEMP20	Retail Employment	2020
OFFEMP20	Office Employment	2020
INDEMP20	Industrial Employment	2020
PUBEMP20	Public Employment	2020
OTHEMP20	Other Employment	2020
TOTEMP20	Total Employment	2020
RETEMP30	Retail Employment	2030
OFFEMP30	Office Employment	2030
INDEMP30	Industrial Employment	2030
PUBEMP30	Public Employment	2030
OTHEMP30	Other Employment	2030
TOTEMP30	Total Employment	2030